

**Remarks**

Claims 1 – 10 are pending in this action. Claims 1 – 10 stand rejected. Based on the following remarks, Applicants respectfully request reconsideration of all pending claims herein.

Applicants mailed a certified copy of Foreign Application, Japanese Application JP2003-038532, July 15, 2004 to the USPTO. Applicants' received a return receipt postcard on July 23, 2005 with an OIPE date stamp of July 19, 2004 indicating that the certified copy of the foreign application was received by the USPTO. However, Applicants have ordered additional certified copies of the priority documents from Japan and will forward them to the USPTO as soon as they are received.

**Claim Rejections – 35 U.S.C. § 103 (a)**

The Office Action stated that claims 1 - 8 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over U.S. Patent No. 6,649,864 issued to De Steur et al. in view of U.S. Patent No. 4,822,974 issued to Leighton.

The Office Action stated that De Steur discloses a laser drilling method in which a perforated mask is used to drill a hole with a predetermined diameter. The Office Action stated that Leighton discloses a laser drilling apparatus, the angle of the beam is controlled by a prism apparatus in order to form various hole shapes. The Office Action further stated that:

It would have been obvious to one skilled in the art at the time of the invention to determine the angle of the beam relative to the axis as taught by Leighton in the De Steur et al. process because this is merely a measurement of the operational parameters and ensures the formation of a quality drilled product (See Office Action page 2).

The Examiner explicitly states that “De Steur et al. does not teach the angle of the wobble

motion.” The “wobble motion” taught in the De Steur et al. process is a circular motion in which the beam remains perpendicular to the work piece and the laser is moved along the circumference of the desired circle to cut a cylindrical hole (e.g. like a hole saw). Applicants contend that neither the Leighton process individually, or in combination with the De Steur process, can be used to achieve a straight, cylindrical hole in a work piece by drilling at an angle incident to the work piece, as taught in Applicants’ claimed invention. Neither would one of ordinary skill in the art be motivated to ensure the formation of a quality product by drilling at an angle with respect to the surface of the work piece and expect to achieve a straight, cylindrical hole, which is substantially perpendicular to the surface of the work piece. Furthermore, neither De Steur, nor Leighton suggest or provide motivation for drilling at an angle incident to a work piece to achieve a straight, cylindrical hole which is perpendicular to the work piece. Thus, Applicants submit that no prima facie case of obviousness, required for a 35 U.S.C. §103 rejection, has been established.

According to 35 USC 103(a), a prima facie case of obviousness must be made from a suggestion or motivation in the references to make Applicant’s claimed invention. It is not enough that one may modify a reference in view of a second reference, but rather it is *required* that the second reference suggest modification of the first reference and not merely provide the capability of modifying the first reference. In *Aqua-Aerobic Systems Inc. v. Richards of Rockford, Inc.* 1 U.S.P.Q.2d, 1945 (D.C. Illinois 1986), the court stated that the fact that a prior reference can be modified to show the claimed invention does not make the modification obvious unless the prior reference suggests the desirability of the modification.

In establishing a case of prima facie obviousness, the court stated in *Ortho-McNeil Pharm., Inc. v. Mylan Labs, Inc.*, 2006 U.S. Dist. LEXIS 34476, that:

In determining obviousness, the PTO employs a two-step analysis. First, it considers whether or not the prior art demonstrates a "prima facie" case of obviousness. The prima facie case is a procedural tool that requires that the examiner initially produce evidence sufficient to support a ruling of obviousness. *In re Kumar*, 418 F.3d 1361, 1366 (Fed. Cir: 2005) (citations omitted). To establish a prima facie case of obviousness, there must be (1) some

suggestion or motivation in the prior art references or "in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine" its teachings; (2) a reasonable expectation of success in doing so; and (3) the prior art references "must teach or suggest all the claim limitations" of the claimed invention. Manual of Patent Examining Procedures ("MPEP") § 706.02(j) (2005). "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure."

It is also a requirement that the PTO avoid using hindsight during examination. In other words, the applicant's invention cannot be used as a blueprint to search for prior art, which, when combined, results in applicant's invention.

*In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998), the court stated:

To prevent the use of hindsight based on the invention to defeat patentability of the invention, the courts require the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed. [...] This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 U.S.P.Q.2D (BNA) 1885, 1888 (Fed. Cir. 1991) [...] When it is necessary to select elements of various teachings in order to form claimed invention, a court ascertains whether there is any suggestion or motivation in prior art to make selection made by applicant. Obviousness can not be established by combining teachings of prior art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. [...] It is impermissible, however, simply to engage in hindsight reconstruction of claimed invention, using applicant's structure as template and selecting elements from references to fill gaps. References themselves must provide some teaching whereby applicant's combination would have been obvious. See *In re Gorman*, 933 F.2d 982 (Fed. Cir. 1991).

Further, the CAFC, in *In Re Oetiker*, 24 USPQ 2d 1443, 1445 (CAFC 1992) held:

There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge can not come from the applicant's

invention itself.

In the case of *In Re Dembiczak*, 50 USPQ 2d 1614 (CAFC 1999) the CAFC held:

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 U.S.P.Q.2D (BNA) 1225, 1232 (Fed. Cir. 1998) (describing "teaching or suggestion or motivation [to combine]" as an "essential evidentiary component of an obviousness holding"); *In re Rouffet*, 149 F.3d 1350, 1359, 47 U.S.P.Q.2D (BNA) 1453, 1459 (Fed. Cir. 1998) ("the Board must identify specifically . . . the reasons one of ordinary skill in the art would have been motivated to select the references and combine them"); *In re Fritch*, 972 F.2d 1260, 1265, 23 U.S.P.Q.2D (BNA) 1780, 1783 (Fed. Cir. 1992) (examiner can satisfy burden of obviousness in light of combination "only by showing some objective teaching [leading to the combination]"); *In re Fine*, 837 F.2d 1071, 1075, 5 U.S.P.Q.2D (BNA) 1596, 1600 (Fed. Cir. 1988) (evidence of teaching or suggestion "essential" to avoid hindsight); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297, 227 U.S.P.Q. (BNA) 657, 667 (Fed. Cir. 1985).

Based on the foregoing, Applicants submit that neither De Steur nor Leighton provide any suggestion, motivation, or objective teaching to use a laser beam at an incident angle to the substrate in order to drill a straight, cylindrical hole. In fact, De Steur teaches away from having angles incident to the work piece to create a straight, cylindrical hole because the De Steur process uses beams of various diameters applied perpendicularly to the work piece to create a straight, cylindrical hole (See De Steur Col. 3 Line 45 – Col. 4 Line 10, Figures 3 -4). Therefore, one skilled in the art would be motivated to use a laser in a manner perpendicular to the work piece in order to create a straight, cylindrical hole because any angle incident on the work piece would create a conical or bi-conical hole.

Similarly, Applicants submit that Leighton discloses a method and apparatus for drilling cylindrical, conical and bi-conical holes. Leighton teaches and suggests that the use of a laser beam which is strictly perpendicular to the work piece will cut a straight, cylindrical hole (see Leighton; Fig. 3, Col. 3 Lines 38 – 50, Claim 4). Leighton further teaches that by angling the laser

incident to the work piece one creates conical or bi-conical holes. One of ordinary skill in the art at the time of the invention would therefore *not* be motivated to use a laser at an angle incident to the work piece and reasonably expect to achieve a straight, cylindrical hole.

Since neither De Steur nor Leighton teach or suggest the use of an angled beam to produce a hole having diameters of a top portion and a bottom portion of the hole substantially equal to each other and the sides of the hole are substantially parallel (see Applicants' claims 1 -10), it would not have been obvious to one of ordinary skill in the art at the time of the invention to modify De Steur as taught by Leighton to *angle* the beam incident to the work piece (not perpendicularly to the work piece) to form a straight, cylindrical hole, which *is* perpendicular to the work piece.

Applicants submit that the arguments described above overcome the rejections of claims 1-8 stated in the Office Action and that Applicants' invention is patentably distinguished from the references cited by the Examiner. Accordingly, Applicants respectfully submit that the rejection of claims 1 – 8 under 35 U.S.C. § 103(a) has been overcome and claims 1-8 are in condition for allowance.

The Office Action stated that claims 9 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable in view of Hiramatsu (USPAP 2004/0222197).

The Office Action stated that Hiramatsu discloses a laser system for drilling holes in a work piece, and includes a CO2 laser oscillator, a condenser lens, a collimeter lens, and a transfer mask. The beam is positioned by galvano mirrors which are adjusted by angle adjustment motors and is finally passed through an f-theta lens before impinging on the substrate.

Applicants submit that the apparatus disclosed by Hiramatsu does not “teach or suggest all the claim limitations” of the claimed invention as required in the Manual of Patent Examining Procedures ("MPEP") § 706.02(j) (2005) for establishing a *prima facie* case of obviousness. Specifically, Hiramatsu does not teach or suggest the claim limitation of claim 9, “... a condenser

lens which determines an angle of the laser beam relative to the board depending on a laser beam passing position of said lens” (See Maeda’s figures 1, 3b, and 7). Instead, Hiramatsu teaches angling galvano mirrors for the purpose of “scanning in the ‘x’ direction” then “scanning in the ‘y’ direction”. No where does Hiramatsu teach or suggest angling the beam so that it passes through the lens at a specific passing position which determines the angle of the laser beam relative to the board. Applicants’ invention angles the galvano mirrors such that the laser is incident on a passing position of the lens, resulting in the laser hitting the work piece at an angle determined by the location on the lens through which the laser passed (see Maeda paragraphs 34, Figs. 3A and 3B, and Claim 9) and results in drilling a straight, cylindrical hole; not angling galvano mirrors to “scan in the ‘x’ direction” then “scan in the ‘y’ direction” as taught by Hiramatsu (See Hiramatsu paragraphs 0137, 0179, and 0208).

In Applicant’s claim 10, the condenser lens itself is angled incident to the work piece such that the laser hits the lens in a different “passing position” thus the laser intersects with the work piece at a specified angle and in a specified location (see Maeda paragraph 48, Fig. 7, and claim 10). Hiramatsu does not teach angling the f-theta lens relative to the work piece to change the angle of the laser beam passing position. Further, Hiramatsu does not teach angling the f-theta lens at all. Therefore Hiramatsu does not teach or suggest the limitation in Applicant’s claim 10: “wherein an angle of said condenser lens is adjustable for changing the laser beam passing position of said lens”.

Applicants submit that the arguments described above overcome the Examiner’s rejections to Claims 9 and 10, and that Applicants’ invention is patentably distinguished from the references cited by the Examiner. Accordingly, Applicants respectfully submit that the rejection of claims 9 and 10 under 35 U.S.C. § 103(a) has been overcome and claims 9 and 10 are in condition for

allowance.

**Summary and Conclusion**

Based on the foregoing, it is respectfully submitted that the pending claims in the subject patent application are in condition for allowance and that the application may be passed to issuance.

The Examiner is urged to call the undersigned at the number listed below if, in the Examiner's opinion, such a phone conference would aid in furthering the prosecution of this application.

Respectfully submitted,

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